

### Claims

1. A method in the drying section or the like of a paper machine or the like, such as a board machine or a finishing machine, in which method
- the web is conveyed, supported by a supporting fabric such as a wire or a felt, over a cylinder, such as a drying cylinder, a roll, or the like, between the cylinder and the supporting fabric,
  - supported by the supporting fabric the web is guided from an opening nip between the cylinder and the supporting fabric toward a roll, such as a suction roll, a turn roll, a wire guide roll, a second cylinder, or the like, and in which
  - 10 - the run of the web from the opening nip toward said roll is supported by a negative pressure created on that side of the wire which is opposite the web, the negative pressure in a so called intensified negative pressure region, i.e. close to the disengaging point between the supporting fabric and the cylinder, being higher than the negative pressure in a so called smaller negative pressure region,
  - 15 i.e. at a distance from this disengaging point,
- characterised** in that
- the negative pressure  $p_{nip}$  is controlled in said intensified negative pressure region according to one or more parameters which act on the runability of the web and which can be varied or which vary during the run, such as
- 20 - the velocity of the web,
  - the solid contents of the web,
  - the composition of the pulp being used,
  - the paper or paper board quality being produced,
  - the grammage of the web,
  - 25 - a characteristic of the web, such as the porosity,
  - the draw acting in the web, or the web tension,
  - the cylinder temperature, and/or
  - the running situation, such as a web break, a threading situation, or normal run,
- so that a desired runability is maintained between the cylinder and the roll.

2. A method according to claim 1, **characterised** in that
- the negative pressure  $p_{nip}$  in the intensified negative pressure region is  $> 500$  Pa, more generally  $\geq 1000$  Pa, but typically however  $\leq 20000$  Pa, preferably even  $< 10000$  Pa, and that
  - 5 - the negative pressure  $p_{wire}$  in the smaller negative pressure region is 10 to 700 Pa, preferably 100 to 500 Pa, most typically 200 to 300 Pa.
3. A method according to claim 1, **characterised** in that, in the drying section where the web is guided from a cylinder to a roll which redirects the travel of the web, the negative pressure  $p_{nip}$  in the intensified negative pressure region is higher than the negative pressure  $p_{roll}$ , which prevails on the surface of the roll redirecting the travel of the web.
- 10 4. A method according to claim 1, **characterised** in that the negative pressure  $p_{nip}$  is controlled in the intensified negative pressure region so that the desired difference in the draw is obtained at the press in order to optimise the paper characteristics.
- 15 5. A method according to claim 1, **characterised** in that the negative pressure region extends at most 300 mm, preferably 40 to 140 mm, typically 80 mm from the disengaging point between the supporting fabric and the drying cylinder in the direction of the opening nip, i.e. in the travel direction of the web.
- 20 6. A method according to claim 1, **characterised** in that the intensified negative pressure region extends at most 300 mm, preferably 40 to 100 mm, typically 70 mm from the disengaging point between the supporting fabric and the drying cylinder against the travel direction of the web.
- 25 7. A method according to claim 1, **characterised** in that, in the drying section the travel of the web is supported by an intensified negative pressure  $p_{nip}$  formed at the opening nip, when the dry solids content of the web is  $\leq 65$  %.

8. A method according to claim 1, **characterised** in that the travel of the web is supported in the intensified negative pressure region by a negative pressure, which is the lower the higher the dry solids content of the web is.

9. A method according to claim 1, **characterised** in that the travel of the web is supported in the intensified negative pressure region by a negative pressure, which is the higher the lower the strength of the web is.

10. A method according to claim 1, **characterised** in that the travel of the web is supported in the intensified negative pressure region by a negative pressure, which is the higher the less chemical pulp the web to be dried contains.

10 11. A method according to claim 1, **characterised** in that the travel of the web is supported in the drying section by an intensified negative pressure  $p_{nip}$  generated mainly at the opening nip of each drying cylinder in the beginning of such a drying section which uses threading with full width.

12. A method according to claim 11, **characterised** in that during the threading with full width there is used an intensified negative pressure in the intensified negative pressure region than during a normal run or a web break.

13. A method according to claim 1, **characterised** in that the travel of the web is supported by an intensified negative pressure generated mainly at the opening nip of each drying cylinder in such a drying section, where drying of a web formed from weak pulp is taking place.

14. A method according to claim 1, **characterised** in that, in a drying section where a blow box is arranged on that side of the supporting fabric which is opposite to the web to generate said intensified negative pressure region between the supporting fabric and the blow box,

25 - air is ejected away from the intensified negative pressure region by one or more ejection nozzles arranged in the blow box at the input side of the intensified negative pressure region, and that

- air is prevented from flowing to the intensified negative pressure region by a throttling means arranged at the output side of the intensified negative pressure region in the blow box.

15. A method according to claim 14, **characterised** in that, in addition,  
5 air is sucked from the intensified negative pressure region by means creating suction arranged in the blow box at the intensified negative pressure region.

16. A method according to claim 1, **characterised** in that, in a drying  
section where a blow box is arranged on that side of the supporting fabric which  
is opposite to the web, to generate said intensified negative pressure region  
10 between the supporting fabric and the blow box,

- air is sucked away from the intensified negative pressure region by means  
arranged in the blow box at the intensified negative pressure region, and that  
- air is prevented from flowing to the intensified negative pressure region by a  
throttling means and/or ejection nozzles arranged in the blow box at the input  
15 and/or output side of the intensified negative pressure region.

17. A device in the drying section of a paper machine or the like, such as  
a paper board machine or a finishing machine, the drying section having at least  
one cylinder, such as a drying cylinder, a roll, or the like, a supporting fabric,  
such as wire or a felt, a turn roll, a wire guide roll, a second cylinder or the like  
20 for redirecting the travel of the wire, and

- means for conveying the web which is supported by a supporting fabric over  
said cylinder, between the cylinder and the supporting fabric,

- means for guiding the web from the opening nip between said cylinder and the  
supporting fabric toward said roll when supported by the supporting fabric, and

25 - means for creating a negative pressure which supports the travel of the web on  
that side of the web which is opposite the supporting fabric, when the web passes  
from the opening nip to said roll, which means create

- an intensified negative pressure in a region which covers the disengaging point between the supporting fabric and the cylinder, and
- a smaller negative pressure in a region which is at a distance from this disengaging point,

characterised in that

the device further comprises control means for controlling the negative pressure  $p_{nip}$  in said intensified negative pressure region according to one or more parameters which act on the runability of the web and which can be varied or which vary during the run, such as

- the velocity of the web,
- the solid contents of the web,
- the composition of the pulp being used,
- the paper or paper board quality being produced,
- the grammage of the web,
- a characteristic of the web, such as the porosity,
- the draw acting in the web, or the web tension,
- the cylinder temperature, and/or
- the running situation, such as a web break, a threading situation, or a normal run,

so that the desired runability is maintained between the cylinder and the roll.

18. A device according to claim 17, **characterised** in that the means for creating the negative pressure supporting the travel of the web comprise a blow box

- in which, at the input border of the intensified negative pressure region, i.e. at the border of the region on the input side as seen in relation to the travel direction of the web, there is arranged an ejection nozzle to eject air away from between the blow box and the supporting fabric, and

- in which, at the output border of the intensified negative pressure region, i.e. at the border on the output side of the region as seen in relation to the travel

direction of the web, there is arranged a throttling means to prevent air from flowing into the intensified negative pressure region.

19. A device according to claim 18, **characterised** in that means are further arranged in the blow box between said ejection nozzle and the throttling means in order to connect the intensified negative pressure region to means creating the negative pressure.

20. A device according to claim 17, **characterised** in that the means for creating the negative pressure for supporting the travel of the web comprise a suction box,  
10 - which in the intensified negative pressure region is connected to means for providing a negative pressure between the blow suction box and the supporting fabric, and  
- in which, at the input border and the output border of the intensified negative pressure region, i.e. at the border of the input side and output side in relation to  
15 the travel direction of the web, there are arranged seals for preventing air from flowing into the intensified negative pressure region.

21. A device according to claim 20, **characterised** in that the seals arranged at the input border of the intensified negative pressure region comprise ejection nozzles which eject air away from the intensified negative pressure  
20 region.

22. A device according to claim 17, **characterised** in that the negative pressure in the intensified negative pressure region is  $> 500$  Pa, advantageously  $\geq 1000$  Pa, but however  $\leq 20000$  Pa, preferably  $< 10000$  Pa.

23. A device according to claim 17, **characterised** in that the intensified  
25 negative pressure region is created in a region which extends from the disengaging point between the supporting fabric and the drying cylinder  
- at most 300 mm, preferably 40 to 140 mm, typically 80 mm in the travel direction of the web,

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- at most 300 mm, preferably 40 to 100 mm, typically 70 mm against the travel direction of the web.

24. A device according to claim 17, **characterised** in that the control means comprise means for controlling the negative pressure in the intensified  
5 negative pressure region according to the speed obtained by measurement or determined in some other way.

25. A device according to claim 17, **characterised** in that the control means comprise means for controlling the negative pressure in the intensified  
negative pressure region according to the dry solid contents obtained by  
10 measurement or determined in some other way.

26. A device according to claim 17, **characterised** in that the control means comprise means for controlling the negative pressure in the intensified  
negative pressure region according to the draw difference or the web tension  
obtained by measurement or determined in some other way, such as by ocular  
15 inspection.

27. A device according to claim 17, **characterised** in that the device is arranged in the drying section a paper machine provided with a single wire run or  
a twin wire run.

